

Date: Tuesday, 8/21/2007 3:43:40 PM
 User: Kim Johnston

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: 02.250 SUPPORT
Job Number	: 34188		
Estimate Number	: 12920		
P.O. Number	: <i>N/A</i>	Part Number	: D28911UP
This Issue	: 8/21/2007 S.O. No. : <i>N/A</i>	Drawing Number	: D2891 REV A1
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: <i>N/A</i> Type : PURCHASED PARTS	Drawing Revision	: A1
Previous Run	: <i>N/A</i>	Material	: <i>N/A</i>
Written By	: <i>[Signature]</i>	Due Date	: 9/20/2007
Checked & Approved By	: <i>[Signature]</i>	Qty:	12 Um: Each
Comment	: Est Rev:A New Issue 07-07-04 JLM		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0

PG

PURCHASING



Comment: PURCHASING

Issue P/O: *4434**cd 07/08/23*

Description: D6104-003

Material: 17-4 PH SS (AMS 5643 OR AISI 630) as per Dwg D6104

Material release note required.

Blank size makes (2) D2891-1

(12)

2.0

D6104003

17-4 SS Roundbar 3.25"OD



Comment: Qty.: 1.0000 Each(s)/Unit Total : 12.0000 Each(s)
 Support 2.25 dia

3.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Recieve & Inspect for Transit Damage

Ensure Material Release Note is attached

*[Signature]**07/09/07*

4.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI LATHE

Turn blank for Haas as per Folio FA046

*[Signature]**07/10/20**12*

5.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

*[Signature]**07/10/20**12*

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: D Date: 07/11/17
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/10/29	4.0	1 piece too short of .007" under tolerance	 07.10.30 per QSI 042	Part acceptable.	 07/10/30	 07/10/30 per QSI 042	 07.10.30 per QSI 042	 07/10/30

NOTE: Date & initial all entries

Date: Tuesday, 8/21/2007 3:43:41 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 02.250 SUPPORT

Job Number: 34188

Part Number: D28911UP

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

HAAS1

HAAS CNC VERTICAL MACHINING #1



Comment: HAAS

Machine as per Folio FA046

Tumble & Deburr

8F 07/11/17 & 18
RMR

(18)

7.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

8F 07/11/17

8.0

QC8

SECOND CHECK



Comment: SECOND CHECK

J.F. 07/11/18

(12)

9.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: SI445

(12)

AS 07/11/19

(12)

10.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07/11/17

Job Completion



W 07.11.19

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	34188
Description: Ø2.250 Support	Part Number:	D2891-1
Inspection Dwg: D2891 Rev. A1		Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2891 Rev.A1/DSK076 Rev.A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	1	2	3	4	By	Date
Lathe Section									
A	2.274	2.279		2.277	2.278	2.276	2.277		
B	3.702	3.722		3.695	3.711	3.714	3.714		
C	2.564	2.584		2.575	2.569	2.571	2.572		
D	0.718	0.738		0.727	0.729	0.727	0.727		
E	0.090	0.110		0.099	0.100	0.101	0.099		
F	2.464	2.484		2.477	2.470	2.476	2.476		
G	2.029	2.049		2.035	2.035	2.033	2.035		
H	2.964	2.984		2.973	2.973	2.972	2.972		
I	0.913	0.933		0.923	0.921	0.922	0.927		
J	0.022	0.042		0.032	0.032	0.032	0.032		
K	0.090	0.110		0.099	0.097	0.099	0.099		
L									
HAAS Section									
AA	0.188	0.193	DT8706	0.189	.188	.188	.188		
AB	0.240	0.260		0.250	.250	.249	.249		
AC	0.115	0.150		0.125	.130	.128	.128		
AD	0.040	0.060		0.055	.055	.058	.055		
AE	0.010	0.020		0.010	.010	.010	.010		
AF	0.240	0.260		0.250	.250	.250	.250		
AG	0.290	0.310		0.298	.297	.280	.300		
AH	0.115	0.150		0.138	.140	.140	.140		
AI	0.454	0.474		0.454	.489	.459	.470		
AJ	2.779	2.789		2.782	2.783	2.783	2.782		
AK	0.240	0.260		0.250	.250	.250	.250		
AL	1.002	1.042		1.040	1.042	1.040	1.042		
AM	0.053	0.073		0.063	.063	.063	.063		
AN	0.257	0.262	DT8683	0.258	.257	.257	.258		
AO	1.663	1.683		1.663	1.682	1.683	1.683		
AP	0.053	0.073		0.063	.063	.063	.063		
AQ	0.022	0.042		0.032	.032	.032	.032		
AR									
AS									
Accept/Reject									

Measured by:	<i>mf</i>
Date:	07/10/20 / 07/11/18

Audited by:	<i>J.F.</i>
Date:	07/11/18

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	<i>[Signature]</i>

DART AEROSPACE LTD	Work Order: 34188
Description: Ø2.250 Support	Part Number: D2891-1
Inspection Dwg: D2891 Rev. A1	Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2891 Rev.A1/DSK076 Rev.A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	15	26	27	48	By	Date
Lathe Section									
A	2.274	2.279		2.277	2.277	2.278	2.277		
B	3.702	3.722		3.714	3.714	3.712	3.712		
C	2.564	2.584		2.573	2.573	2.574	2.574		
D	0.718	0.738		0.727	0.726	0.726	0.726		
E	0.090	0.110		0.101	0.101	0.100	0.100		
F	2.464	2.484		2.477	2.476	2.477	2.477		
G	2.029	2.049		2.035	2.035	2.034	2.032		
H	2.964	2.984		2.973	2.973	2.974	2.972		
I	0.913	0.933		0.925	0.927	0.927	0.929		
J	0.022	0.042		0.032	0.032	0.032	0.032		
K	0.090	0.110		0.099	0.099	0.106	0.100		
L									
HAAS Section									
AA	0.188	0.193	DT8706	.188	.188	.188	.188		
AB	0.240	0.260		.252	.250	.258	.255		
AC	0.115	0.150		.128	.128	.127	.127		
AD	0.040	0.060		.058	.058	.058	.060		
AE	0.010	0.020		.015	.015	.015	.015		
AF	0.240	0.260		.240	.240	.240	.240		
AG	0.290	0.310		.300	.300	.300	.300		
AH	0.115	0.150		.140	.140	.140	.140		
AI	0.454	0.474		.460	.460	.460	.460		
AJ	2.779	2.789		2.782	2.781	2.782	2.782		
AK	0.240	0.260		.250	.250	.250	.250		
AL	1.002	1.042		1.040	1.040	1.040	1.040		
AM	0.053	0.073		.063	.063	.063	.063		
AN	0.257	0.262	DT8683	.258	.258	.258	.258		
AO	1.663	1.683		1.683	1.683	1.681	1.681		
AP	0.053	0.073		.063	.063	.063	.063		
AQ	0.022	0.042		.032	.032	.032	.032		
AR									
AS									
Accept/Reject									

Measured by: <i>mf</i>
Date: 02/10/36

Audited by: J.F.
Date: 07/11/18

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD	Work Order: 34188
Description: Ø2.250 Support	Part Number: D2891-1
Inspection Dwg: D2891 Rev. A1	Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2891 Rev.A1/DSK076 Rev.A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	19	210	211	212	By	Date
Lathe Section									
A	2.274	2.279		2.278	2.277	2.278	2.279		
B	3.702	3.722		3.712	3.712	3.712	3.714		
C	2.564	2.584		2.574	2.574	2.574	2.574		
D	0.718	0.738		0.727	0.727	0.726	0.727		
E	0.090	0.110		0.101	0.100	0.101	0.101		
F	2.464	2.484		2.477	2.478	2.477	2.477		
G	2.029	2.049		2.035	2.032	2.034	2.033		
H	2.964	2.984		2.973	2.973	2.973	2.973		
I	0.913	0.933		0.923	0.927	0.925	0.922		
J	0.022	0.042		0.032	0.032	0.032	0.032		
K	0.090	0.110		0.100	0.100	0.100	0.106		
L									
HAAS Section									
AA	0.188	0.193	DT8706	.188	.188	.188	.188		
AB	0.240	0.260		.255	.255	.259	.258		
AC	0.115	0.150		.128	.127	.127	.127		
AD	0.040	0.060		.055	.055	.058	.058		
AE	0.010	0.020		.015	.015	.015	.015		
AF	0.240	0.260		.250	.250	.250	.250		
AG	0.290	0.310		.300	.300	.290	.290		
AH	0.115	0.150		.140	.140	.145	.140		
AI	0.454	0.474		.460	.460	.463	.460		
AJ	2.779	2.789		2.780	2.780	2.780	2.780		
AK	0.240	0.260		.250	.250	.250	.250		
AL	1.002	1.042		1.040	1.040	1.039	1.038		
AM	0.053	0.073		.063	.063	.063	.063		
AN	0.257	0.262	DT8683	.257	.257	.257	.257		
AO	1.663	1.683		1.680	1.680	1.692	1.682		
AP	0.053	0.073		.063	.063	.063	.063		
AQ	0.022	0.042		.032	.032	.032	.032		
AR									
AS									
Accept/Reject									

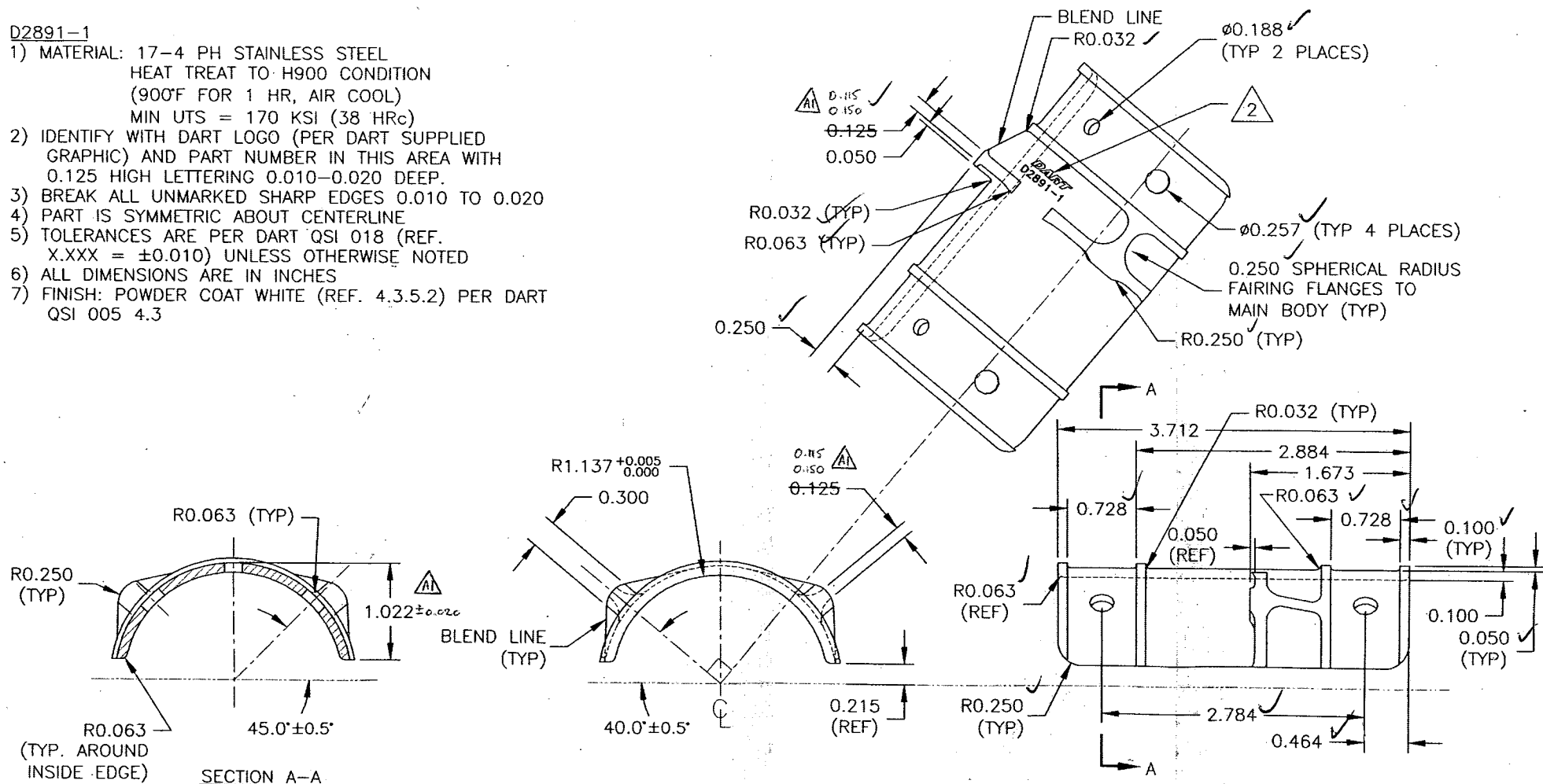
Measured by:	<i>me</i>
Date:	07/10/30

Audited by:	J.F. 07/11/18
Date:	

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

D2891-1

- 1) MATERIAL: 17-4 PH STAINLESS STEEL
HEAT TREAT TO H900 CONDITION
(900°F FOR 1 HR, AIR COOL)
MIN UTS = 170 KSI (38 HRC)
- 2) IDENTIFY WITH DART LOGO (PER DART SUPPLIED GRAPHIC) AND PART NUMBER IN THIS AREA WITH 0.125 HIGH LETTERING 0.010-0.020 DEEP.
- 3) BREAK ALL UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) TOLERANCES ARE PER DART QSI 018 (REF. X.XXX = ± 0.010) UNLESS OTHERWISE NOTED
- 6) ALL DIMENSIONS ARE IN INCHES
- 7) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.3



NO. 3413
WORK ORDER
WITHOUT NOTICE
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
ENGINEERING
RETURN TO
SHOP COPY

COPYRIGHT © 2000 BY DART AEROSPACE LTD.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

AI	CP	02.01.23	UPDATE DIMS AS MANUFACTURED
A		00.11.17	NEW ISSUE
DESIGN	CP	DRAWN BY	CP
CHECKED	CP	APPROVED	CP
DATE	00.11.17	DRAWING NO.	D2891
		TITLE	2.250 SUPPORT
		REV. A	SHEET 1 OF 1
		SCALE	1:1

DART DART AEROSPACE LTD.
HARRISBURG, ONTARIO, CANADA



P.O. BOX 977
SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

SOLD TO
A M CASTLE, INC
3400 N WOLF RD
FRANKLIN PARK, IL 60131

SHIP TO
A M CASTLE, INC
26800 MILES RD
BEDFORD HEIGHTS OH 44146

OUR ORDER NO.
FC-11330-7

DATE
07/16/07

CUSTOMER ORDER # & DATE
10-31163

CUSTOMER REQ. #

DISTRICT

B PARSONS

SHIPPED FROM

SYRACUSE

DESCRIPTION OF MATERIAL

SIZE

CRU 17-4PH RT A IAC 42470 3.250 RD
AMC-3174-10 REV 7 ASME-SA564-04ED T630 ASTM-A564-04 T630
AMS-56430 AISI 630 UNS-S17400

HEAT NO.

CHEMICAL ANALYSIS

HEAT NO.	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA
A18939	.037	.42	.027	.022	.63	4.09	15.28	.11	3.22	.29	.012

CASTLE METALS CORP.

DATE RCVD 7/25/07
IAC 42470
APPROVED BY [Signature]

QUANTITY

HEAT NO.

MECHANICAL PROPERTIES

1814 # A18939 TENSILE PSI YLD.2%FSI XELONG40 RED/AREAX HARDNESS
BHN 356
CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL: RC 35
203,000 174,070 12.3 51.1 BHN 415

MACRO TEST OK
FERRITE 5%
MAGNAFLUX F/S = 0/0

REDUCTION RATIO: 27.5:1
MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES AT TEMPERATURE -
AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18610.
MATERIAL INGEST CAST.
NAFTA - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT
MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH SPECIFICATION REQUIREMENTS.
CRUCIBLE MATERIALS CORPORATION
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

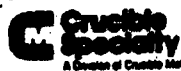
SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF , 20

NOTARY PUBLIC

CERTIFIED BY:

QUALITY ASSURANCE REPRESENTATIVE



P.O. BOX 977
SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

S O L D T O	A M CASTLE, INC	S H I P T O	A M CASTLE, INC	OUR ORDER PS-11330-
	3400 N WOLF RD FRANKLIN PARK, IL 60131		26800 MILES RD BEDFORD HEIGHTS OH 44146	DATE 5/7/16/07

CUSTOMER ORDER # & DATE 10-31163	CUSTOMER REQ. #	DISTRICT B PARSONS	SHIPPED FROM SYRACUSE
-------------------------------------	-----------------	-----------------------	--------------------------

DESCRIPTION OF MATERIAL

CRU 17-4PH RT A IAC 42470
AMC-3174-10 REV 7 ASME-SA564-04ED T630 ASTM-A564-04 T630
AMS-56430 AISI 630 UNS-S17400

SIZE

3.250 RD

CHEMICAL ANALYSIS

HEAT NO.

HEAT NO.	C	MN	P	S	SI	NI	CR	MO	CU	CE	TA
A18939	.037	.42	.027	.022	.63	4.09	15.28	.11	3.22	.29	.012

CASTLE METALS CORP.

DATE RCVD 7/25/10

IAC 42470

APPROVED BY *[Signature]*

MECHANICAL PROPERTIES

QTY

HEAT NO.

1314 # A18939

TENSILE PSI YLD.2XPSI

2XELONG40

RED/AREAX

HARDNESS

BHN 356

CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL:
203,000 174,050 12.3 51.1

SC 35

BHN 415

MACRO TEST OK

FERRITE 5 %

MAGNAFLUX F/S = 0/0

REDUCTION RATIO: 27.5:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES AT TEMPERATURE
AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #15610.

MATERIAL INGET CAST.

NAFTA - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PROD
MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF . 20

NOTARY PUBLIC

CERTIFIED
BY:

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN
WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE
SPECIFICATION REQUIREMENTS.
CRUCIBLE MATERIALS CORPORATION
ACTING BY AND THROUGH ITS SPECIALTY METALS D

QUALITY ASSURANCE REPRESENTATIVE